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ABSTRACT

Reported is a study designed to investigate the relationships among pupil/teacher interpersonal compatibility, student self-concept in science, and student attitude toward science. The sample consisted of 205 ninth-grade earth science students. Two classes each from six school districts were involved, using 13 classrooms and 7 science teachers. All classes were using the New York State Regents Earth Science Syllabus, a lab-based earth science program. The FIRO-B (Fundamental Interpersonal Relations Orientation-Behavior) instrument was administered to all students and teachers in the study, to determine compatibility scores. The Science Attitude Scale (adapted from the Mathematics Attitude Scale), a Likert type instrument, was used to measure attitude toward science. Self concept in science was measured by the Self-Concept in Science Semantic Differential consisting of 17 seven-point scales of the Osgood type. Data were subjected to correlational analysis procedures. None of the compatibility variables was significantly correlated with the criterion variables. However, there was a significant correlation (.05 level) between the students' last year's final grade in science and both attitude toward science and self-concept in science. (Author/PEB)

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PUPIL/SCIENCE TEACHER INTERPERSONAL COMPATIBILITY AND SCIENCE ATTITUDES

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PURPOSE

Recent reports suggest that classroom social variables may be important correlates of student achievement. Rubin (1973) hypothesized that if students could be matched with teachers of similar emotional makeup, personality conflicts might be substantially reduced. Parker (1973) suggest using interpersonal variables to predict success in treatments that make use of extensive individual interaction. The purpose of this study is to investigate the relationships among pupil/teacher interpersonal compatibility, student self-concept in science, and student attitude toward science.

CONCEPTUAL DEVELOPMENT OF THE PROBLEM

Social group theory has provided paradigms which suggest that observed behavior is determined by the interaction of individuals with a role. (Getzels and Thelen, 1960, Sergiovanni and Starratt, 1971). In summary, there exist mediating variables that interact with classroom roles to determine behavior. If the mediating variables are present in a positive form, there should theoretically be positive goal attainment. On the other hand, if the mediating variables are present in a negative form, there should be negative goal attainment.

In this study, pupil/teacher interpersonal compatibility is considered to be a mediating variable. If a compatible relationship exists between the pupil and teacher, goal success should be positively mediated. This paper seeks to investigate the relationships between compatibility and selected school success variables.

FIRO COMPATIBILITY THEORY

Most interpersonal compatibility studies have been based on the Fundamental Interpersonal Relations Orientation Theory or FIRO Theory. proposed by Schutz (1958). Schutz defines the dimensions of interpersonal behavior in terms of inclusion behavior (I), control behavior (C), and affection behavior (A).

Inclusion behavior is the need to establish and maintain a satisfactory relationship with people with respect to association and interaction. In an interpersonal encounter, this dimension is the first to be entered as two people evaluate each other and determine appropriate interaction. Next, the control dimension is entered. Control behavior is defined as the need to establish and maintain a satisfactory relationship with people with respect to control and power. Affection is the last behavior to be entered; it requires a greater amount of time to develop a relationship based on love and affection.

In evaluating the interpersonal relations of two people involved in an encounter, it is necessary to consider both the expressed behaviors and the expected behaviors. Therefore, there is for each individual a set of expressed behaviors (expressed inclusion, e^I, expressed control, e^C, and expressed affection, e^A) and a set of wanted or desired behaviors (wanted inclusion, w^I, wanted control, w^C, and wanted affection, w^A).

Interpersonal compatibility is a property of a relationship among two or more persons, between an individual and a role, or between an individual and a task situation-one that leads to the mutual satisfaction of interpersonal needs and harmonious coexistence (Schutz, 1958, p.105).

There are four types of interpersonal compatibility that are measured via the FIRO-B. In Figure 1, the high interchange quadrant

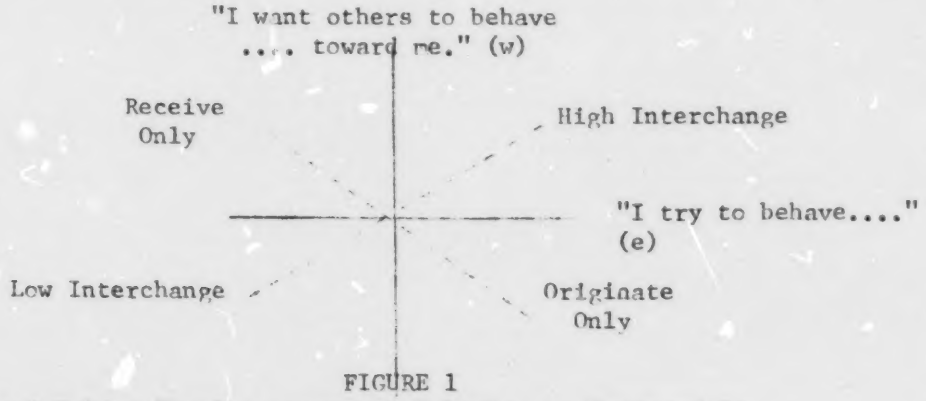

FIGURE 1
General Schema For Interpersonal Behavior As Measured By FIRO-B (Schutz, 1958)

represents those who prefer a great deal of exchange of some "commodity" (inclusion, control or affection). The low interchange quadrant includes those who wish to avoid the exchange of the "commodity", i.e., those neither initiating nor wanting inclusion, control or affection behavior. In a case of maximum compatibility, two individuals' scores should be similar with respect to the interchange axis. Interchange incompatibility (xK) arises when the members of the dyad disagree on the amount of interchange in a particular area. Originator compatibility (oK) is based on the complementarity of two people along the receive-originate diagonal. According to this model, two people who are compatible should complement each other, that is, be equidistant from the center of this diagonal. Conflict arises when there is disagreement regarding who shall

originate relations and who shall receive them. Reciprocal compatibility (rK) is a similar measure, but it is based on the main axes rather than the diagonals. It is based on the assumption that the expressed behavior of one member of the dyad must equal the wanted behavior of the other member, and vice versa. Total compatibility (K) represents the sum of the three area compatibilities or compatibility types.

FIRO INTERPERSONAL COMPATIBILITY STUDIES

Interpersonal compatibility studies using the FIRO Theory have been conducted in regard to pupil/teacher situations, tutorial situations, intern/supervisor situations, counselor/counselee situations and group situations. Table 1 shows a list of these studies.

A review of the literature reveals a lack of studies involving science teacher and pupil interpersonal compatibility. Furthermore, most previous studies have used achievement as a correlate of the compatibility variables. Since FIRO Theory is directly related to the affective domain, it was decided in this study to use affective measures as correlates of the compatibility variables. So, attitude toward science and self-concept in science were the affective measures chosen.

None of the studies reported in the literature show significant findings related to reciprocal compatibility. Where significance was reported, it generally was noted in terms of interchange and originator compatibility. It seems reasonable to anticipate the

TABLE 1

Study Types Using FIRO Compatibility Theory

Study Type	Author
Pupil/Teacher	Hutcherson (1963), Collins (1970)
Student Teacher/Supervisor	DiTosto (1968), Brabble (1969), Nelson and Hutcherson (1970)
Tutorial	Schultz (1969)
Intern/Supervisor	Snyder (1969)
Counselor/Counselee	Sapolsky (1965), Paravonian (1966), Arndt (1969), Mendelsohn and Rankin (1969)
Group	Estadt (1964), Shalinsky (1967), Edwards (1968), Riley (1970), Schutz (1958), Rudner (1953)

presence of much pupil/teacher interchange in a lab-based science classroom. For this reason, interchange compatibility in three dimensions (xK^I, xK^C, xK^A) are used as correlates. Originator compatibility, in three dimensions (oK^I, oK^C, oK^A), is used because the teacher typically "originates" interpersonal behavior and the student typically "receives".

In addition to the six compatibility variables, the final grade in the previous year's science course will be used as a cognitive measure.

SAMPLE

The sample consisted of 205 ninth grade Earth Science students- 2 classes each from the Syracuse Public Schools, Liverpool Schools, Chittenango Schools, Baldwinsville Schools, East Syracuse-Minoa Schools, and North Syracuse Schools. All of the classes were using the New York State Regents Earth Science Syllabus which is a lab-based Earth Science program.

RESEARCH DESIGN

The FIRO-B (Fundamental Interpersonal Relations Orientation-Behavior was administered to all students and teachers involved in the study. The compatibility scores were derived from the results of the FIRO-B (Schutz, 1958).

Attitude toward science was measured with the Science Attitude Scale, which was adapted from the Mathematics Attitude Scale (Aiken, 1972). The test was constructed using Likert's method of summated ratings.

Self-concept in science was measured with the Self-Concept in Science Semantic Differential. This instrument was adapted from the Self-Concept Semantic Differential developed by Schwartz and Tangri (1965). The test consisted of 17 seven-point scales of the Osgood type.

HYPOTHESES

The following hypotheses were tested at the .05 level of significance:

1. There will be no significant correlation between attitude toward science and the six compatibility variables (oK^I, oK^C, oK^A, xK^I, xK^C, xK^A) or the previous year's final grade in science.
2. There will be no significant correlation between self-concept in science and the six compatibility variables (oK^I, oK^C, oK^A, xK^I, xK^C, xK^A) or the previous year's final grade in science.

RESULTS

Table 2 shows the correlations obtained between the compatibility variables (oK^I, oK^C, oK^A, xK^I, xK^C, xK^A), last year's final science grade and attitude toward science and self-concept in science. Hypotheses 1 and 2 were not accepted because there was a significant correlation between last year's final science grade and both attitude toward science and self-conept in science. None of the compatibility variables was significantly correlated with the criterion variables.

TABLE 2

	$_{o}K^{I}$	$_{o}K^{C}$	$_{o}K^{A}$	$_{x}K^{I}$	$_{x}K^{C}$	$_{x}K^{A}$	Final Grade
Attitude Toward Science	-.09[a]	-.07	-.04	-.01	.04	.01	.17*
Self-Concept In Science	-.05	.01	.00	-.09	.01	-.03	.23*

* significance at α = .05

[a] = Pearson r correlation coefficient

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